

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on October 11, 2002, and the references cited therewith.

Claims 21, 31, 38, 40-42, 51 and 58 are amended, claim 59 is canceled, claims 60-63 are added; as a result, claims 21-22, 27, 31, 38-58 and 60-63 are now pending in this application.

Claim 59 has been canceled solely to advance the prosecution of the present application, and without prejudice to its further prosecution in an appropriately filed continuing or divisional application.

The amendments made herein have been to clarify the claims and are not intended to limit the scope of equivalents to which any claim element may be entitled. The amendments to the claims and new claims have support throughout the specification. No new matter has been added as a result. Applicant respectfully requests reconsideration of the above-identified application in view of the amendments above and the remarks that follow.

Claims 21, 31, 38, 40-42 and 51 have been amended to clarify that the bran is treated with an excess amount of hydrogen peroxide solution and an aqueous alkaline solution. Support for these amendments can be found in the specification at page 11, lines 26-28.

Claims 56 and 58 have been amended to correct typographical errors. Claim 58 was also amended to clarify that the bran is bleached with a combination of hydrogen peroxide and ozone. Support for this amendment can be found in original claim 59.

§102 Rejection of the Claims

Claims 38 and 51 were rejected under 35 USC § 102(b) as being anticipated by Devic (U.S. 5,480,788).

The Examiner states that Devic discloses a bleached bran product obtained by treatment with alkaline aqueous hydrogen peroxide solution and also in the presence of a chelating agent.

Devic discusses a process of bleaching plant materials under a dry environment in the solid state (col. 4, lines 40-45; col. 5, line 61 through col. 6, line 2) using an alkaline aqueous hydrogen peroxide solution, such that all of the solution is absorbed by the plant material without establishing any liquid phase in contact therewith (claim 1).

In contrast, claim 38, as amended, recites a bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran and suitable for use as an additive in foods. Additionally, Claim 51, as amended, recites a bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by first treating bran with a chelating agent to produce reduced transition metal content bran, the reduced transition metal content bran further treated with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, to produce the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran.

Devic does not teach each element of claims 38 and 51 because it does not teach a product produced with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution.

Devic does not anticipate the claims, as amended. Applicant respectfully submits that claims 38 and 51 are allowable in their present form and notification to that effect is respectfully requested.

§103 Rejection of the Claims

Claims 21-25, 27, 31-59 were rejected under 35 USC § 103(a) as being unpatentable over Devic in view of Ramaswamy (U.S. 5,023,103).

The Examiner admits that Devic does not disclose the L value, "the" properties, adding bran to the type of foods claimed, the particle size and use of ozone. The Examiner states that Ramaswamy teaches that ozone is a known bleaching agent and that it would have been obvious to vary the treatment to obtain a bleached product having varying degrees of whiteness. The Examiner further states that Devic teaches that the amount of hydrogen peroxide can vary from 1-20% depending on the desired degree of whiteness and that one can vary the degree of whiteness depending on the intended use of product, giving examples. The Examiner further states that it would have been obvious to add the bleached bran product to any foods when it is desirable to increase the fiber content of the products. The Examiner further states that since the Devic bleached bran product is obtained by treating with alkaline aqueous hydrogen peroxide

solution, it will have the properties as claimed and that it would have been obvious to use other known bleaching agents. The Examiner continues by stating that Ramaswamy discloses ozone is a known bleaching agent. The Examiner further states that in an absence of showing of unexpected results, it would have been obvious to use any "other" known chelating agents.

Applicant respectfully submits that the Examiner has not established the *prima facie* obviousness of the present claims. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the cited references themselves or in the knowledge generally available to an art worker, to modify the reference or to combine reference teachings so as to arrive at the claimed invention. Second, the art must provide a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. In re Ochiai, 37 USPQ2d 1127 (Fed. Cir. 1997) (When evaluating the scope of a claim, every limitation in the claim must be considered).

Applicant respectfully traverses the above assertions by the Examiner. Applicant further notes that claims 22-25, 27 and 43-50 are dependent on claim 21; claims 32-37 are dependent on claim 31; claim 39 is dependent on claim 38; and claims 52-57 are dependent on claim 51. The additional limitations provided in dependent claims cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is determined to be nonobvious.

Devic does not teach or suggest the claimed invention. As noted above, Devic discusses a process of bleaching plant materials under a dry environment in the solid state (col. 4, lines 40-45; col. 5, line 61 through col. 6, line 2) using an alkaline aqueous hydrogen peroxide solution, such that all of the solution is absorbed by the plant material without establishing any liquid phase in contact therewith (claim 1). Admittedly, the dry treatment in Devic allows bleaching to only be conducted "at the surface of the fibers, the materials to be treated not being wetted by the aqueous phase." (col. 5, line 67 through col. 6, line 2).

In contrast, claim 21, as amended, recites a bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran and suitable for admixing with whole wheat flour to produce white whole wheat flour having an L

value on the Hunter scale of at least about 82. Claim 31, as amended, recites a whole wheat flour comprising a bleached bran product produced by treating bran derived from a cereal grain with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran, the whole wheat flour having an L value on the Hunter scale of at least about 82 and a dietary fiber content of about 10 to 12%. Claim 36 recites a finished baked good prepared from the whole wheat flour of claim 31. Claim 38, as amended, recites a bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran and suitable for use as an additive in foods. Similarly, claim 40, as amended, recites a refrigerated uncooked or bakeable dough product, claim 41, as amended, recites a ready-to-eat cereal and claim 42, as amended, recites a cooked cereal dough comprising bleached bran, the bleached bran produced (in claims 40-42) by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran having an antioxidant activity at least 15 to 35% higher than native bran. Claim 51, as amended, recites a bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by first treating bran with a chelating agent to produce reduced transition metal content bran, the reduced transition metal content bran further treated with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, to produce the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran. Claim 58, as amended, recites a bleached bran product comprising bran derived from a cereal grain, the bran bleached with a combination of hydrogen peroxide and ozone or peracetic acid in the presence of heat to produce the bleached bran product.

Those skilled in the art will recognize the many differences in properties that are obtainable when an excess amount of solution is used (which will inherently affect the cell walls) as compared to performing the process in the solid state (which allows the bleaching to be conducted only at the surface). Claim 24 recites the product of claim 21 having a water absorption value about six times higher than native bran. Claim 27 recites the product of claim 21 wherein the antioxidant activity is increased due to increased availability of ferulic acid. New

claim 63 recites the bleached bran product of claim 21 wherein bitter flavor components present in the native bran are reduced. (See also the specification at pages 15-17).

Ramaswamy does not overcome the deficiencies of the primary reference. Ramaswamy discusses a white water absorbent fiber made from a waste product, i.e., oat hulls, having a high percentage of total dietary fiber and hemicellulose and a low concentration of lignin and silica. The primary process in Ramaswamy involves an alkaline digestion of ground oat hulls, with the bleaching step being optional.

It is not clear that the primary and secondary references are even in the same field of endeavor. At a minimum, the product in the primary reference and the product in the secondary reference are fundamentally different from each other and such critical differences must be recognized. In re Bond, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990), *reh'g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990).

Applicant notes that ozone is recited only in claim 58, as amended (and new claims 60-62). Furthermore, there is no suggestion in *Devic as to the desirability* of using ozone, nor is there any indication of any appreciation of the problem being solved by Applicant's invention. It is not even clear that the prior art can be modified as suggested, but the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988). Applicant requests the Examiner to either provide evidence of such motivation or withdraw this rejection. See also In re Sang Su Lee, No. 00-1158 (Serial No. 07/631,240), (Fed. Cir.), decided January 18, 2002 (attached hereto).

With regard to claim 58, Applicant is not claiming to be the first to use ozone as a bleaching agent. Applicant is the first however, to provide a bleached bran product comprising bran derived from a cereal grain, the bran bleached with a combination of hydrogen peroxide and ozone or peracetic acid in the presence of heat to produce the bleached bran product, as recited in claim 58, as amended.

In any case, the suggested combination does not teach each and every element of Applicant's claims. The references neither independently, or combined, contain each and every element of Applicant's claimed invention. Applicant respectfully submits that independent

claims 21, 31, 36, 38, 40-42, 51 and 58 and the claims that depend from them, are patentably distinct from the cited references, either alone or in combination. Claims 21-25, 27, 31-59, as amended, each viewed as a whole, are not suggested by the cited references and not obvious under 35 USC § 103(a). Reconsideration and withdrawal of this rejection is respectfully requested.

AMENDMENT & RESPONSE UNDER 37 C.F.R. § 1.116 - EXPEDITED PROCEDURE

Serial Number: 09/663,914

Filing Date: September 18, 2000

Title: BLEACHED BRAN AND BRAN PRODUCTS AND METHODS OF PREPARATION

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Dkt 869 027US1

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (515- 233-3865) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date DECEMBER 11, 2002 By Barbara J. Clark
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Box AF, Commissioner of Patents, Washington, D.C. 20231, on this 11th day of December, 2002.

Dawn M. Postle
Name

Dawn M. Postle
Signature

Clean Version of Pending Claims

BLEACHED BRAN AND BRAN PRODUCTS AND METHODS OF PREPARATION

Applicant: Adelmo Monsalve-Gonzalez et al.

Serial No.: 09/663,914

21. A bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran and suitable for admixing with whole wheat flour to produce white whole wheat flour having an L value on the Hunter scale of at least about 82.
22. The product of claim 21 wherein about five (5)% of the bleached bran product, by weight, is added to the whole wheat flour.
23. The product of claim 21 having an L value of between about 82 and 93.
24. The product of claim 21 having a water absorption value about six times higher than native bran.
25. The product of claim 21 wherein native flavor components are reduced or deactivated.
27. The product of claim 21 wherein the antioxidant activity is increased due to increased availability of ferulic acid.
31. A whole wheat flour comprising a bleached bran product produced by treating bran derived from a cereal grain with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to

35% higher than native bran, the whole wheat flour having an L value on the Hunter scale of at least about 82 and a dietary fiber content of about 10 to 12%.

32. The whole wheat flour of claim 31 substantially free of hydrogen peroxide.

33. The whole wheat flour of claim 32 prepared from soft white wheat or hard white wheat.

34. The whole wheat flour of claim 33 prepared from light bran.

35. The whole wheat flour of claim 33 having a pH of about 6.3 to 6.7.

36. A finished baked good prepared from the whole wheat flour of claim 31.

37. The whole wheat flour of claim 31 admixed with sugar, salt, and leavening.

38. A bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran and suitable for use as an additive in foods.

39. The bleached bran product of claim 38 wherein the product is added to foods selected from the group consisting of dry mixes, ready-to-eat cereals and soy.

40. A refrigerated uncooked or bakeable dough product comprising bleached bran, the bleached bran produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran having an antioxidant activity at least 15 to 35% higher than native bran.

41. A ready-to-eat cereal comprising bleached bran, the bleached bran produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran having an antioxidant activity at least 15 to 35% higher than native bran.

42. A cooked cereal dough comprising bleached bran, the bleached bran produced by treating bran with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, the bleached bran having an antioxidant activity at least 15 to 35% higher than native bran.

43. The product of claim 21 wherein the hydrogen peroxide solution has a pH of about 6 to 7 and the aqueous alkaline solution is added in an amount sufficient to raise the pH of the native bran and hydrogen peroxide solution to about 9 to 9.5.

44. The product of claim 43 wherein the hydrogen peroxide solution is an aqueous solution having a concentration of between about 6 and 40%, further wherein the hydrogen peroxide solution is added in amounts of about 1 to 20 parts of hydrogen peroxide solution to about 100 parts of native bran.

45. The product of claim 44 wherein the hydrogen peroxide solution and alkaline solution are heated together with the bran at a temperature of about 80 to 90 °C for about 20 to 60 minutes.

46. The product of claim 44 wherein the hydrogen peroxide solution and alkaline solution are heated together with the bran under a pressure of about 103.4 to 138 kPA (15 to 20 psi) and a temperature of about 120 to 130 °C for about one (1) to five (5) minutes.

47. The product of claim 44 wherein the cereal grain is selected from the group consisting of wheat, rice, barley, corn (maize), oats, triticale, amaranth, soybeans and mixtures thereof.

48. The product of claim 47 wherein the cereal grain is red wheat or white wheat.

49. The product of claim 48 wherein the cereal grain is a soft winter white wheat that is milled to produce a light bran.

50. The product of claim 21 wherein the bleached bran product is comprised of particles, each particle having a particle size of at least about 100 microns.

51. A bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by first treating bran with a chelating agent to produce reduced transition metal content bran, the reduced transition metal content bran further treated with an excess amount of a hydrogen peroxide solution and an aqueous alkaline solution, to produce the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran.

52. The product of claim 51 wherein the chelating agent is selected from the group consisting of orthophosphate, metaphosphate, pyrophosphate, polyphosphate, calcium EDTA and sodium EDTA.

53. The product of claim 52 wherein the chelating agent is calcium EDTA or sodium EDTA in a concentration of between about 0.02 and 0.1%.

54. The product of claim 51 wherein the reduced transition metal content bran is blanched to inactivate catalase and peroxidase enzymatic systems.

55. The product of claim 54 wherein the reduced transition metal content bran is blanched at a temperature of between about 75 to 85 °C for about three (3) to ten (10) minutes, further wherein the residual enzyme activity after blanching is below about 10 CIU/g bran.

56. The product of claim 51 wherein the bleached bran product is treated with catalase to remove residual hydrogen peroxide.

57. The product of claim 56 wherein between about 0.1 and 0.4% of catalase, by weight, is added to the bleached bran product at a temperature of about 60 °C, further wherein the hydrogen peroxide concentration is reduced to less than about five (5) PPM following catalase treatment.

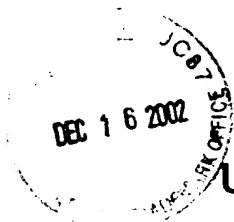
58. A bleached bran product comprising bran derived from a cereal grain, the bran bleached with a combination of hydrogen peroxide and ozone or peracetic acid in the presence of heat to produce the bleached bran product.

60. A bleached bran product comprising bleached bran derived from a cereal grain, the bleached bran product produced by treating bran with a hydrogen peroxide solution and an aqueous alkaline solution, followed by an ozone treatment, the bleached bran product having an antioxidant activity at least 15 to 35% higher than native bran and suitable for admixing with whole wheat flour to produce white whole wheat flour having an L value on the Hunter scale of at least about 82.

61. The bleached bran product of claim 60 wherein the bran is treated with about 0.1 to 2% ozone, by weight, at a pH of about 4 to 5.

62. The bleached bran product of claim 61 wherein the reaction of ozone and bran is in the range of about 90 to 95%.

63. The bleached bran product of claim 21 wherein bitter flavor components present in the native bran are reduced.



United States Court of Appeals for the Federal Circuit

00-1158
(Serial No. 07/631,240)

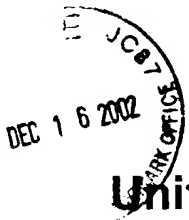
IN RE SANG SU LEE

Richard H. Stern, of Washington, DC, argued for Sang Su Lee. With him on the brief was Robert E. Bushnell.

Sidney O. Johnson, Jr., Associate Solicitor, of Arlington, Virginia, argued for the Director of the U.S. Patent and Trademark Office. With him on the brief were John M. Whealan, Solicitor, and Raymond T. Chen, Associate Solicitor. Of counsel were Maximilian R. Peterson and Mark Nagumo, Associate Solicitors.

Appealed from: Patent & Trademark Office
Board of Patent Appeals and Interferences

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United States Court of Appeals for the Federal Circuit

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00-1158
(Serial No. 07/631,240)

IN RE SANG-SU LEE

DECIDED: January 18, 2002

Before NEWMAN, CLEVINGER, and DYK, Circuit Judges.

NEWMAN, Circuit Judge.

Sang-Su Lee appeals the decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office, rejecting all of the claims of Lee's patent application Serial No. 07/631,210 entitled "Self-Diagnosis and Sequential-Display Method of Every Function."¹ We vacate the Board's decision for failure to meet the adjudicative standards for review under the Administrative Procedure Act, and remand for further proceedings.

¹ Ex parte Lee, No. 1994-1989 (Bd. Pat. App. & Int. Aug. 30, 1994; on reconsid'n Sept. 29, 1999).

The Prosecution Record

Mr. Lee's patent application is directed to a method of automatically displaying the functions of a video display device and demonstrating how to select and adjust the functions in order to facilitate response by the user. The display and demonstration are achieved using computer-managed electronics, including pulse-width modulation and auto-fine-tuning pulses, in accordance with procedures described in the specification. Claim 10 is representative:

10. A method for automatically displaying functions of a video display device, comprising:
 - determining if a demonstration mode is selected;
 - if said demonstration mode is selected, automatically entering a picture adjustment mode having a picture menu screen displaying a list of a plurality of picture functions; and
 - automatically demonstrating selection and adjustment of individual ones of said plurality of picture functions.

The examiner rejected the claims on the ground of obviousness, citing the combination of two references: United States Patent No. 4,626,892 to Nortrup, and the Thunderchopper Helicopter Operations Handbook for a video game. The Nortrup reference describes a television set having a menu display by which the user can adjust various picture and audio functions; however, the Nortrup display does not include a demonstration of how to adjust the functions. The Thunderchopper Handbook describes the Thunderchopper game's video display as having a "demonstration mode" showing how to play the game; however, the Thunderchopper Handbook makes no mention of the adjustment of picture or audio functions. The examiner held that it would have been obvious to a person of ordinary skill to combine the teachings of these references to produce the Lee system.

Lee appealed to the Board, arguing that the Thunderchopper Handbook simply explained how to play the Thunderchopper game, and that the prior art provided no

teaching or motivation or suggestion to combine this reference with Nortrup, or that such combination would produce the Lee invention. The Board held that it was not necessary to present a source of a teaching, suggestion, or motivation to combine these references or their teachings. The Board stated:

The conclusion of obviousness may be made from common knowledge and common sense of a person of ordinary skill in the art without any specific hint or suggestion in a particular reference.

Board op. at 7. The Board did not explain the "common knowledge and common sense" on which it relied for its conclusion that "the combined teachings of Nortrup and Thunderchopper would have suggested the claimed invention to those of ordinary skill in the art."

Lee filed a request for reconsideration, to which the Board responded after five years. The Board reaffirmed its decision, stating that the Thunderchopper Handbook was "analogous art" because it was "from the same field of endeavor" as the Lee invention, and that the field of video games was "reasonably pertinent" to the problem of adjusting display functions because the Thunderchopper Handbook showed video demonstrations of the "features" of the game. On the matter of motivation to combine the Nortrup and Thunderchopper references, the Board stated that "we maintain the position that we stated in our prior decision" and that the Examiner's Answer provided "a well reasoned discussion of why there is sufficient motivation to combine the references." The Board did not state the examiner's reasoning, and review of the Examiner's Answer reveals that the examiner merely stated that both the Nortrup function menu and the Thunderchopper demonstration mode are program features and that the Thunderchopper mode "is user-friendly" and it functions as a tutorial, and that it would have been obvious to combine them.

Lee had pressed the examiner during prosecution for some teaching, suggestion, or motivation in the prior art to select and combine the references that were relied on to show obviousness. The Examiner's Answer before the Board, plus a Supplemental Answer, stated that the combination of Thunderchopper with Nortrup "would have been obvious to one of ordinary skill in the art since the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software," and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial." The Board adopted the examiner's answer, stating "the examiner has provided a well reasoned discussion of these references and how the combination of these references meets the claim limitations." However, perhaps recognizing that the examiner had provided insufficient justification to support combining the Nortrup and Thunderchopper references, the Board held, as stated supra, that a "specific hint or suggestion" of motivation to combine was not required.

This appeal followed.

Judicial Review

Tribunals of the PTO are governed by the Administrative Procedure Act, and their rulings receive the same judicial deference as do tribunals of other administrative agencies. Dickinson v. Zurko, 527 U.S. 150, 50 USPQ2d 1930 (1999). Thus on appeal we review a PTO Board's findings and conclusions in accordance with the following criteria:

5 U.S.C. §706(2) The reviewing court shall--

(2) hold unlawful and set aside agency actions, findings, and conclusions found to be--

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

(E) unsupported by substantial evidence in a case subject to sections 556 and 557 of this title or otherwise reviewed on the record of an agency hearing provided by statute;

For judicial review to be meaningfully achieved within these strictures, the agency tribunal must present a full and reasoned explanation of its decision. The agency tribunal must set forth its findings and the grounds thereof, as supported by the agency record, and explain its application of the law to the found facts. The Court has often explained:

The Administrative Procedure Act, which governs the proceedings of administrative agencies and related judicial review, establishes a scheme of "reasoned decisionmaking." Not only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational.

Allentown Mack Sales and Service, Inc. v. National Labor Relations Bd., 522 U.S. 359, 374 (1998) (citation omitted). This standard requires that the agency not only have reached a sound decision, but have articulated the reasons for that decision. The reviewing court is thus enabled to perform meaningful review within the strictures of the APA, for the court will have a basis on which to determine "whether the decision was based on the relevant factors and whether there has been a clear error of judgment." Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 416 (1971). Judicial review of a Board decision denying an application for patent is thus founded on the obligation of the agency to make the necessary findings and to provide an administrative record showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusions. See In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) (review is on the administrative record); In re Gartside, 203 F.3d 1305, 1314, 53 USPQ2d 1769, 1774 (Fed. Cir. 2000) (Board decision "must be justified within the four

corners of the record").

As applied to the determination of patentability vel non when the issue is obviousness, "it is fundamental that rejections under 35 U.S.C. §103 must be based on evidence comprehended by the language of that section." In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983). The essential factual evidence on the issue of obviousness is set forth in Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966) and extensive ensuing precedent. The patent examination process centers on prior art and the analysis thereof. When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See, e.g., McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the] references," a question of fact drawing on the Graham factors).

"The factual inquiry whether to combine references must be thorough and searching." Id. It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris Inc., 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000) ("a showing of a suggestion, teaching, or motivation to combine the prior art references is an 'essential component of an obviousness holding'" (quoting C.R. Bard, Inc., v. M3 Systems, Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998))); In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction

of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) ("teachings of references can be combined only if there is some suggestion or incentive to do so.") (emphasis in original) (quoting ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)).

The need for specificity pervades this authority. See, e.g., In re Kotzab, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed"); In re Rouffet, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998) ("even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious."); In re Fritch, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references").

With respect to Lee's application, neither the examiner nor the Board adequately supported the selection and combination of the Nortrup and Thunderchopper references to

render obvious that which Lee described. The examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). Thus the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion.

Deferential judicial review under the Administrative Procedure Act does not relieve the agency of its obligation to develop an evidentiary basis for its findings. To the contrary, the Administrative Procedure Act reinforces this obligation. See, e.g., Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co., 463 U.S. 29, 43 (1983) ("the agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'") (quoting Burlington Truck Lines v. United States, 371 U.S. 156, 168 (1962)); Securities & Exchange Comm'n v. Chenery Corp., 318 U.S. 80, 94 (1943) ("The orderly function of the process of review requires that the grounds upon which the administrative agency acted are clearly disclosed and adequately sustained.").

In its decision on Lee's patent application, the Board rejected the need for "any specific hint or suggestion in a particular reference" to support the combination of the Nortrup and Thunderchopper references. Omission of a relevant factor required by precedent is both legal error and arbitrary agency action. See Motor Vehicle Manufacturers, 463 U.S. at 43 ("an agency rule would be arbitrary and capricious if the agency . . . entirely failed to consider an important aspect of the problem"); Mullins v. Department of Energy, 50 F.3d 990, 992 (Fed. Cir. 1995) ("It is well established that agencies have a duty to provide reviewing courts with a sufficient explanation for their decisions so that those decisions may be judged against the relevant statutory standards, and that failure to provide such an explanation is grounds for striking down the action."). As discussed in National Labor Relations Bd. v. Ashkenazy Property Mgt. Corp., 817 F.2d 74, 75 (9th Cir. 1987), an agency is "not free to refuse to follow circuit precedent."

The foundation of the principle of judicial deference to the rulings of agency tribunals is that the tribunal has specialized knowledge and expertise, such that when reasoned findings are made, a reviewing court may confidently defer to the agency's application of its knowledge in its area of expertise. Reasoned findings are critical to the performance of agency functions and judicial reliance on agency competence. See Baltimore and Ohio R. Co. v. Aberdeen & Rockfish R. R. Co., 393 U.S. 87, 91-92 (1968) (absent reasoned findings based on substantial evidence effective review would become lost "in the haze of so-called expertise"). The "common knowledge and common sense" on which the Board relied in rejecting Lee's application are not the specialized knowledge and expertise contemplated by the Administrative Procedure Act. Conclusory statements such as those here provided do not fulfill the agency's obligation. This court explained in Zurko, 258 F.3d

at 1385, 59 USPQ2d at 1697, that "deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is 'basic knowledge' or 'common sense.'" The Board's findings must extend to all material facts and must be documented on the record, lest the "haze of so-called expertise" acquire insulation from accountability. "Common knowledge and common sense," even if assumed to derive from the agency's expertise, do not substitute for authority when the law requires authority. See Allentown Mack, 522 U.S. at 376 ("Because reasoned decisionmaking demands it, and because the systemic consequences of any other approach are unacceptable, the Board must be required to apply in fact the clearly understood legal standards that it enunciates in principle")

The case on which the Board relies for its departure from precedent, In re Bozek, 416 F.2d 1385, 163 USPQ 545 (CCPA 1969), indeed mentions "common knowledge and common sense," the CCPA stating that the phrase was used by the Solicitor to support the Board's conclusion of obviousness based on evidence in the prior art. Bozek did not hold that common knowledge and common sense are a substitute for evidence, but only that they may be applied to analysis of the evidence. Bozek did not hold that objective analysis, proper authority, and reasoned findings can be omitted from Board decisions. Nor does Bozek, after thirty-two years of isolation, outweigh the dozens of rulings of the Federal Circuit and the Court of Customs and Patent Appeals that determination of patentability must be based on evidence. This court has remarked, in Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc., 183 F.3d 1347, 1356, 51 USPQ2d 1415, 1421 (Fed. Cir. 1999), that Bozek's reference to common knowledge "does not in and of itself make it so" absent evidence of such knowledge.

The determination of patentability on the ground of unobviousness is ultimately one of judgment. In furtherance of the judgmental process, the patent examination procedure serves both to find, and to place on the official record, that which has been considered with respect to patentability. The patent examiner and the Board are deemed to have experience in the field of the invention; however, this experience, insofar as applied to the determination of patentability, must be applied from the viewpoint of "the person having ordinary skill in the art to which said subject matter pertains," the words of section 103. In finding the relevant facts, in assessing the significance of the prior art, and in making the ultimate determination of the issue of obviousness, the examiner and the Board are presumed to act from this viewpoint. Thus when they rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record. The failure to do so is not consistent with either effective administrative procedure or effective judicial review. The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.

Alternative Grounds

At oral argument the PTO Solicitor proposed alternative grounds on which this court might affirm the Board's decision. However, as stated in Burlington Truck Lines, Inc. v. United States, 371 U.S. 156, 168 (1962), "courts may not accept appellate counsel's post hoc rationalization for agency action." Consideration by the appellate tribunal of new agency justifications deprives the aggrieved party of a fair opportunity to support its position; thus review of an administrative decision must be made on the grounds relied on by the agency. "If those grounds are inadequate or improper, the court is powerless to

affirm the administrative action by substituting what it considers to be a more adequate or proper basis." Securities & Exchange Comm'n v. Chenery Corp., 332 U.S. 194, 196 (1947). As reiterated in Federal Election Comm'n v. Akins, 524 U.S. 11, 25 (1998), "If a reviewing court agrees that the agency misinterpreted the law, it will set aside the agency's action and remand the case -- even though the agency (like a new jury after a mistrial) might later, in the exercise of its lawful discretion, reach the same result for a different reason." Thus we decline to consider alternative grounds that might support the Board's decision.

Further Proceedings

Sound administrative procedure requires that the agency apply the law in accordance with statute and precedent. The agency tribunal must make findings of relevant facts, and present its reasoning in sufficient detail that the court may conduct meaningful review of the agency action. In Radio-Television News Directors Ass'n v. FCC, 184 F.3d 872 (D.C. Cir. 1999) the court discussed the "fine line between agency reasoning that is 'so crippled as to be unlawful' and action that is potentially lawful but insufficiently or inappropriately explained," quoting from Checkosky v. Securities & Exch. Comm'n, 23 F.3d 452, 464 (D.C. Cir. 1994); the court explained that "[i]n the former circumstance, the court's practice is to vacate the agency's order, while in the latter the court frequently remands for further explanation (including discussion of the relevant factors and precedents) while withholding judgment on the lawfulness of the agency's proposed action." Id. at 888. In this case the Board's analysis of the Lee invention does not comport with either the legal requirements for determination of obviousness or with the requirements of the Administrative Procedure Act that the agency tribunal set forth the findings and

explanations needed for "reasoned decisionmaking." Remand for these purposes is required. See Overton Park, 401 U.S. at 420-221 (remanding for further proceedings appropriate to the administrative process).

VACATED AND REMANDED